

emeronTl 2

beckvTüa ngnnakarsk le lak

I-eKa lbNgenemeeon

emeronTl1)anbBabCamyngesckepménbeckvTüangkarRKbRKgbeckvTüa kgemeronTl2enHeyig
ngskSaScerAbEnmeToteTae lnnakarmycnnénbErbr lbeckvTüa . eRkayeB lbBabemeronenH
nsStngGacEsgy lncncmycnnndcxagerKam³

- ✓ nnakarsxan²rbssk le laknaeB lbcb,n
- ✓ nnakarbeckvTüasxan² naeB lbcb,nngGnaKt
- ✓ \TB lénbErbr lbeckvTüaeTae lsgm

II-ninakarsxan²rbSBPBe lak (Significant global trend)

enACBkTl1 Rtgcnc The World Today eyg)anBPakSae lncncmycnn Ed l bga j BkarpasbrBmy
éfeTAmyéfrbsBPBe laktamry³karERbRb l\TQbQrrbsbeckvTüa ngkeninénsak lPavny
km . kgemeronTl2enHeyigngskSaEsgy l lGtbEnmeTae lkarvvtrbssk le laktamry³nnakar
mycnnkdcCaBTnakTngrbsvaeTAngsk le lakpgEdr . xagerKamCacncmycnnEd leFeGay
sk le lakmankarpasbr³

- karpasbreTae lvsyneya)ayrbssk le lakEd lBFabman
- karekneLgnvmeFüa)ayeFBaNCkmf²
- karekneLgénésdkcesr ng kare lceLgnvBPBe lakKanRBEntamry³lhrén³
 - Ø vneyaKTn (Investment)
 - Ø kenh]sSahkm (Industry)
 - Ø Btman ng (Information)
 - Ø klagB lkm (Individual)

\T,veygcabepmBPakSaeTae lktasxan²Ed l eFkarEkERbesdkrbssk le lakdcCa karekneLlg
énsk lPavnykm karekneLgénbeckvTüaCaBessvskyBüTr TrKmnaKm ng BtmanvTüa

karERbRb l\ryabfrbssgm karekneLgnvk lagB lkmcrHCa^{tsaRs} ng karekneLgnvrebobeF BaNCKmf² (Privatization and liberalization) . ktaTagenHkBgEfteNreTAmx\tQbQr ng C³\TB l\yagxagd l esdkc sgm kdcCateNlkarGaCkmmnanarbsBPBe l akpgEdr .

√ **sk l Pavnykm** (Globalization)

ka l B l 25 b 35 qamnRBEdnrbsRbeTsnim^{y²edr}tyagsxankgkarraragb CaKnabmyBkar RbktRbECgrbsRkmhnbreTs . srabbcb,n RBEdnesdkc vahakdcCaE l gmannyeTot eh^ykgkarxanEck b CaKnabénkarRbktRbECgenaH . CakEsgJTahrNRkmhn BMW CarKmhGa l mg EteKp l trfynenA Pakxagt,g Carolina . Ford Ed l mankaryal y kNa l enAÉ Detroit l trfyn Mercury Tracers rbsRkmhnRtv)anp l teLgena Mexico . sk l PavnykmmnEmnmannyRtmEtCakareFGaCvkmqgRbeTsenaHeT vaCakaryTsarsbs Rkmhnedm,lBRgkTipSar ng karxteTArkk lagB l km bvtFatedlEd l ca)acpgEdr . JTahrNRkmhn Sony kBgTT l)anp l RbeyaCnCaerCnBkareFBaNCkme l BPBe l akCaCag EtTipSarCbn . JTahrNmyeTotedaysarkarRbktRbECgekneLg sBéfmanRkmhEd l manTitagp l tenAshrdGaemrcmycnn)an mkebkkeragcRkenARbeTscnedayk lagB l km enATienHmanté l efak ng karpasbrneya)ayrbsRbeTscnpgEdr .

√ **karERbRb l beckvTüa** (Technological Change)

karvvt\tQbQrrbs beckvTüakCaktam^{yC³\TB l d l sgm}Ca^tEdr . ka l B l 20 b 30qamn eygBGacman l TPaBeFlkarTnakTngbpasbrBtmaneTAv j eTAmkdcsBéfenHeT . \LvenHCamybeckvTüakBüTr ng Internet BPBe l akhakdcCaenACtKaeslrKanRBEdn . manrebobeFBaNCkmmmycnn kBgEtBgEpyagxageTae l beckvTüaTagenH . JTahrN Online meeting, video conference, E-commerce, Online transaction, E-mail, CAD, CAM ng e-Shopping . crGkRsm^yeTAemi l ebsnkarya l yrbsGksBéfKan Computer mash ftc l g mash Fax Caedlm etkarya l yenahlman l kN³yagdcemc?

√ **karERbRb l neya)ayrbssk l e l ak**

karvvtBesdkcEpnkarmkCa esdkcesrrbsbNa l RbeTsmycnnkCaktabHBa l d l tenl karvvt^esdkc rbsk l e l akEdr JTahrNdcCakarebkT l ayTipSar rbsRbeTscn)anKram

kEhgyagxagkad lTpSaGrb ngGaemrc. karcnayeTae lsnxsxsgmngkarRbqagGeBl
ePvrkmbBgEtCaRbFanbTfrbssk l e lakbnabBmanGeBePrvkm 11 kBaa 2001 .
manRkmhn Air line enAshrdGaemrcmynnrvtbTTa RkmhnxHRtvkatbnybKlk ng
krtcnayeTae lsnxsxRtv)anekineLghsBkarsan .

taragsgb ktEd l e FeGaysk l e lakpasbr (Forces of Global Change)

kt (Forces)	TahrNl (Examples)
Nature of the workforce bErbr l énbryakaskargar	. keninPaBcrHénvb,Fm (More cultural diversity) . karekteLgénGkmanCna j (Increase in professionals)
Technology beckvTüa	. GnPaBkBüTrkanEte l On ng manté l kanEtefak (Faster and cheaper computer) .]bkrNTnakTngc l tf ² (New mobile communication devices)
Economic Shocks PaBc l ac l Epkesdkc	. karekneLlg ng FakchénGRtahn (Rise and fall of stocks) . té l R)akd l aFakCH (Decline in the value of the Dollar) . karekneLgén té l eRbgeqA (Surge in Oil Prices)
Competition karRbktRbECg	. karRbktRbECgCask l (Global competitors) . karekneLgén BaNCKme l lbNa jeGLCRtnc (Growth of e-commerce)
Social Trends nnakarsgm	. karkatbnykeninénmnsSCat (Retirement of Baby Boomers) . karcabGamrNtbndacRsyal (Increase interest in urban living)
World Politics neya)ayBPBe l ak	. neya)ayebkTipSarbsRbeTscn (Opening of markets in China) . sRgamRbqagePrvkm (The war on terrorism following 9/11/01)

III-karEsgy lBnnakarbeckvTüasxan²

bdivtnlbeckvTüaBttman

Electronic Commerce- SedAeTAe lIrebobeFBaNCkmmYRbePTna^{stvtS21} edaykaredaHdrTn j b karTTatKatamryHbeckvTüaeGLCrtnc (Information Technology).

Telecommunication – SedAeTAe lIkarTnakTngKa^{tamry}HRbBnTrKmnaKmnTenlBberbExS . GkeFCn j b bK lkeFkar eTah^{stenAeRkAkarya} lye kGacTnakTngCamykargar b bK lkepSg² eTotEd lstenAkkgarya lye)an .

Information Technology- beckvTüaBttmanCabeckvTüaEd lGacrSaTk Eckcay vPaK ng rcna TnnayedaykBüTr.

Information Communication Technology- CabnSén IT ng Telecommunication .

Virtual Workplace- SedAeTAe lIbrsankargarEbbeGLCrtnc .]TahrN Multiuser Simulation Environment mnSsenAqayBKaeTgacTnakTngeFkarCamyKa hakbdcCastenActKaBt² dcCa Online Conference...

Development of new materials- karbegltvtFatedlmf²CnseGayvtFatedlmcaSed lpl t Bl FnFanFmCat .]TahrN CnseGaykareRbR)asEdkEfb mkerbR)asssmasFatKmpascsrabp ltrfyn ng ynehaH.

• **plbHba lrsbeckvTüaBttman** (Staggering advancements in information technology)

-IT GaceGayeygc l eTakanBPBéncenHdgyagrhs ^{tamry³}kareRbR)asbeckvTüakBüTr ng TrKmnaKmn .]TahrNbNa j Internet (World Wide Web)

-IT Gacp l nvBesafkmyagRbesrtamry³ Simulation and Expert system mnca)acGnvt CakEsg]TahrNkarSkSarBvFebkynahaH b rfePgCaedlm

-lTB lrsbeckvTüaBttmanGaceFeGay teNlrkarepSg² ng pltp lbeckvTüa Gacepr eTAv j eTAmktamry³bNa j kBüTr kanEtgayRs l rshngcNaytc Ed l ka lBmnmnGaceFeTA)an

-eFeGaymanTnakTngkanEtCtrvagGkptpg ngGtfCn . b)atkarbRmgTk Camnnv pltp lsercsrabGklkbn .]TahrN E-Commerce ng Just In-time Inventory, Online Transaction

karERbRb l TagGsenH)anka tbnynvcga yPmsaRénGaCvkm yagxagehyvaGacedybt
eTAngesckRtvkarrbsGtfCn)anyagqabrhs.

- **karpa sbrB** Economies of Scale eTA Economies of Scope **tamry HRbBn** CAD, FMS ng
CIM, CAM

tamry³beckvTüa Tenbf²dcCa Computer Aid Design b Computer-Integrated
Manufacturing b Computer Aid Manufacturing eFeGaytenrkarGaCvkmTT l)annvp l RbeyaCn
CaeRcndcCa³

- ka tbn yeB l ev l aén cgakp l tkm (shorter product life cycle)
- kareFeGayserc)anRBmKaTagKNPaB éfedm nge l ,óncl eTakanTipSar
- eFeGaykanEtRbesrEpdkdCBan
- CRm j mCÄmN l p l tkm xtCtTipSar ngéfedm
- begin karRbktRbECgBlkardgCBan tamGakaseTAmefüa)aydkCBanepSgeTot

- **karécbDitvtFatedmf²** (New Materials)

Gttka l beckvTüaRtv)aneKerBkgkarrkrkvTfatedmBlkgdl beFeGayvakanEtRbesreLgEtbcn,
karbegttvtFatedmkanEtgays l .]TahrNvtFatedmf²dcCa “super polymers, composites,
fiber optics, fine ceramics . l .” Rtv)aneKbegteLgenAtambNa l RbeTseCOne l OnxagEpK
]sSahkm . vtFatedmTagenHC³\TB l yagxag d l té lesdkc brsan ng FnFanFmCat .

karGPvDñEpKvbeckvTüa (Biotechnology) kkBgp l nvmeFüa)aydsxanpgEdrkgp l tkmdcCa³

√ cNlGahar

√ teNrka l (Process) rbs]sSahkm

√ karRKbRKgsn l

RkmhnEd l eRbteNaHRsayf²TagenHngTT l)anPaBeCaKCye l lkarRbktRbECgnaeB l GnaKt.

IV- \TB l énbErbr l beckvTüaeTae l lsgm ng esdkcl

ehtG)anCaenAeB l manbErbr l beckvTüaeFeGaymankarGPvDñesdkc? ebeygRkeLkeTAeml l
Gttka l etmnsSeFGxHedml,edaHRsayCvPaBrseArbsBkeK? etp l tp l ngesvakmGxHedman
enAe l lTipSar? etesdkcbrsmnsSkgCnanenaHmanrbragyagdcemc?]TahrNedml,)anRsvmnsS

RtvCkKasdl ngPrasedaykl agTagéftagyb RtverobcRbBnTk ngkarEfTaCaRbcaerogra l éf .
 bEnG²Rtv)anpasbr sBéfmnSScabepmeroneRbR)asmašn begitmašn ngrkrkbeckvTüaepSg²eF
 yagNaeGaykargarRbcaéfrbsBkeKkanEtmanRbsTPaBxsCagmnngrhsCagmn. edaysar
 bErbr lénbeckvTüa sgmmanRbBnTnakTngTenb² manmeFüa)ayeFdeNryagGsarüman]brkrN
 eGLcRtnc ngfamB l eRbR)aSRkbRKankgkarB l grbtbtkarRbcaéfeGaykanEtRbesrCa l dab.
 TagenH)aneFeGayesdkcsgmpasbr\TQbQrBsgmkargarEd l eRbedaykl ag (Muscle Power)
 eTASgmkargareRbedaycenH (Brain Power).

dcenHeTaHRbeTSGPvDén ng kBgGPvDénkeday manktamydsxanEd l c l rmeFeGayesdkcman
 kar l t l asKktabErbr l beckvTüa (Technological Change).

e teFdcemcedlm,eGayGgPaBmankarGPvDénbeckvTüa (Technological Development)?
 manmeFüa)ayBrK karRsavRCav ngkarGPvDén (Research and Development) ngnac l beckvTüa
 (Technology Transfer).

kgcncenHeygngskSaGBNTB l énbErbr l beckvTüaTae l³

- √ krt Macro (The Nation level) ng
- √ krt Micro (The firm level)

t Effects of technological change on macro Level

edlm,lskSaeTae l NTB l rbsbeckvTüaTae l esdkcsgmmy (Macro Level) eygRtvBntüeTae l l
 cncmymcndcxagerkam³

- √ \TB l énbErbr l beckvTüaTae l keninesdkc
- √ \TB l énbErbr l beckvTüaTae l p l tkm
- √ \TB l énbErbr l beckvTüaTae l k l agB l km

k-\TB l énbErbr l beckvTüaTae l keninesdkc

CaTeTAKeninesdkcRtv)aneKKteTae l keninrbs GDP ng GNP . eTaHbCa GNP
 manRBEdnrbsva kgkarvaseTae l esdkcBtEmn bEneB l xHvakRtv)aneKymkeRbpgEdredm,
 eFCargasesdkc . manÉksarxHeKvaskrtesdkcrbsRbeTsmymfamankarrkcerin Rtv)aneKKt

eTae l krtCvPaBrseArbsRbCaCn (GDP income per capita), krtvb,Fm (literacy) ng krtGay (life expectancy) pgEdr .

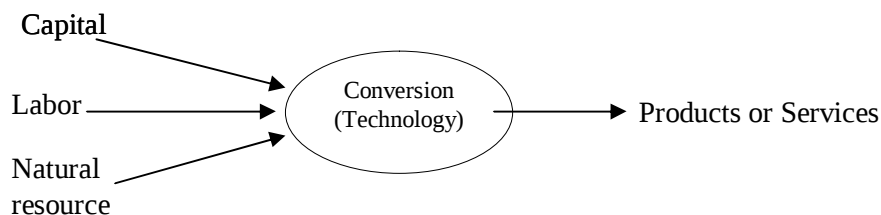
eyagttambTBesaFnenARbeTSGaemrc

enARbeTSGaemrcGkesdkcvTdcCae lak Solow, Abbramowitz, Fabricant, ng Denison)anBüayamerBlnvbeckeTsstTenibCaeRchedm,lskSaeTae lITnakTngrvagkenhesdkcngbErbr l beckvTüa (eyagttamÉksa American Economy). tamkarskSarbs Denison enAcenaHqa 1929 ng 1957 kenhesdkcrbsshrdGaemrc 40%)anmkBkarécRbDtbeckvTüa (kenhesdkcGaemrcrk l t lasxagenAeB l Gaemrc cabepmskraCén]sSahkm Technical Introduction). EpkeTae l kar skSaenHvaCapstagmyEd l bBaakfa karcabepmén Technological innovation vaC³\TB l yagxag eTae l kenhesdkcGaemrc .

manpstagmyeTotEd lRtv)anrkeXj tamkarskSarbsGkesdkcxage lK esdkcrbsRbeTS Cbn cabepmmankeninenAeB l karcnayeTae l R&D kanEttag ehykarFakcheSdkcrbsGaemrc enAeB l krtcnayeTae l R&D cabepmFakch (In fact, there is evidence to link the growth of the Japanese economy with increased R&D expenditure and decline in the US economy with decreased R&D spending. Source: Japan Economy) .

x-\TB l énbErbr l beckvTüaeTae l p l itPaB

esdkcsgmeRbR)as ktaklagB l kmm l Fn ng FnFanFmCat Camxc l (Input) edm, p l tCap l t p l ng esvakmEd l CaesckRtvkarrbssgm . ÉbeckvTüaK CameFüa)aymykgkar bE l gmxcl TagenaHeTACamxec j (output). mxec j ngTT l)anTnp l kanEtRbesrenAeB l meFüa)ay beckvTüaRtv)aneKeRbR)asRbkbedayRbsTPaB.]TahrNbeckvTüa ATM, CAM, CAD, INTERNET)anpasbrcgakp l tkmTagEpkesvakmngp l tkm .



-cncsxanenAkgp l tPaBK ktp l tkm dcnHkarkatbnryHeB l p l tkm eGaycnnénp l tp l
enAefr b begincnnp l tp l EtrkSav tFatedm (Input) eGayenAefr vaCakar l)akRbsnebeyg
mnmanbeckvTüaRKbRkan ng f².

-edaybeckvTüaKComeFüa)ayEd l eKerbsrabbE l g Input eTACa Output dcnHeygGacsnt)anfa
enAeB l Ed l beckvTüaERbRb l enaHnaeGayp l tPaBngERbRb l eTAtamenahEdr.

American Case Study

-manGkvPaKCaerCh dcCae lak Kendrick, Griliches, Mansfield, Minasian ngGkepSg²eTot
)aneFkarSkSaGBTnakTngrvagkarERbRb l beckvTüa eTae l lkeninp l tPaBkgvsyp l tkm ng
kskm .

-kgenaHe lak Kendrick)anrkeXl j fa enARbeTSGaemrcenAcenaHqa 1919 ng 1953 ktp l tPaB
én]sahkmsrbmanTnakTngyagxageTAngsténkarcnayeTae l l R&D eFobeTAngkar l k.

-e lak Mansfield ng Manasian Kat)anskSaRsavRCaveTae l l]sahkmKml ng erbgeqA)anbga j fa
GRtaénkarpasbrp l tPaBmanTnakTngeTAngGRtakeninénkarcnayeTae l l R&D Ed l Rkmhn)an
cnay.

K-\TB l énbErbr l beckvTüaeTae l l k l agB l km

\TB l énbErbr l beckvTüaeTae l l k l agB l kmGacmanPaBeTAngmk (Controversial) .

mankary l eXl j BrpyKaEd l)aneKteLlgceBaH\TB l rbs R&D eTae l l k l agB l km³

✓ kary l eXl j T1 beckvTüaERbRb l eFeGay)atbgkargar

✓ kary l eXl j T2 beckvTüaERbRb l begiteGaymankargarkanEteRch

✓ Cnka l kary l eXl j Tag2xage l RtvdcKaGaRsyTae l l ka l ³eTs³ .

mannyfarbsnebkarsavRCavngGPvD/en (R&D) Rtv)aneFeLlgedm,lp l tCap l tp l beckvTüa f
myEd l eFeGayk l agB l kmkanEtmanRbsTPaBenaH trvkark l agB l kmkkanEtfyEdr. dcnH
kgryHeB l ximy trvkargarkRtvkatbnyeTAtamenahEdr ehYRbsnebp l tPaBkanEtxsRtv)an
eFeGayté l p l tp l kanEtefakCagmn naeGaytrvkarp l tp l ngeKneLlgenaHtrvkarkargar ng
ekneLlgnaeGaytrvkark l agB l kmRtveKneLgv j CaFmta .

- mannyfaGgPaBRtvEtcabepmbga j beckvTüaedm,|

§ rs (Survive)

§ plcenj (Profit)

§ ngkenln (Growth)

]TahrNénkareRbR)asbeckvTüarbs Packed Like Sardines

RkmhndkCBanTen j edayynehaHrbsCbn (JAL))anbegltynehaHfedlm,dkCBanRtismRTs bEn kg l kN³edayymneRbR)asTksmRT . dcentHedlm,lrkSaeGayRtenArsenAkgstNPaBFmtamyek RtvchnaykardkCBanTksmRT 20dgénTgnRt. eKGacerbR)asTgnTk4dgénTgnRtebsn CastN PaBRtv)ankatbnyedayTkkk. e llsBenHeTAeTotkareRbR)asTkkkvamanKNvbtedaySaTgn ng PaBERcsrbsva .

dcentH JAL)anrkrkvFedayefyagNaeGaykardkCBanRbRBteTA)an edaykatbnyGksEn enA kgTkedlm,jeGayTgnTkfycheFidcentHRkmhnGackatbnyéfedlm)anyagsem,lmngCaKNsm,t mykgkarRbktRbECg . beckvTüaEd l JAL erBeKeHafa anabiosis . beckvTüaenHGackatbny cNayBl 60d laGaemrckg5KILRkameTA 8.70d laGaemrc. This new technology has great benefits for JAL, customers and fish producers close to Japan (Philippine and Vietnam).

BPakSa

-creFkarEbgEckfakCaRkm Rkmnm²RtvmansmaCk 3eTA 5nak

-crBBNnaGBTsSn³rbsGkceBaHbrsankargarngBaNCkmka l Bl qa1960 .

edayeqysnrdcxagerkam³

✓etRkmhnEdreCaKCyCaRkmhnman l kN³yagdcemc?

✓ettrnaTrbsk l agB l kmEdrmanCna j manGxH?

✓ettrnaTrbsbeckvTüamanGxH?

-crKteTArkGnaKtv j mg qa2010 ehhyeqysnrEd l enH.

-crcattNagRkmmak eLgkarBarce l yrbsxn.